10.0 TASK-SPECIFIC WINDOW DESIGN

10.1 DATA ENTRY WINDOWS

A data entry window, shown in figure 10-1, provides a template to display, enter, change, and delete data. The data fields in the window are organized by sequence of use, frequency of use, or importance, with related fields appearing together and separated from unrelated fields. If users are entering data from a hardcopy form, the window format is identical to the hardcopy format. When a data entry window contains different kinds of controls for data entry (e.g., text fields, option menus), the controls are arranged for efficient data entry using the pointing device or keyboard and to minimize hand movement between input devices.

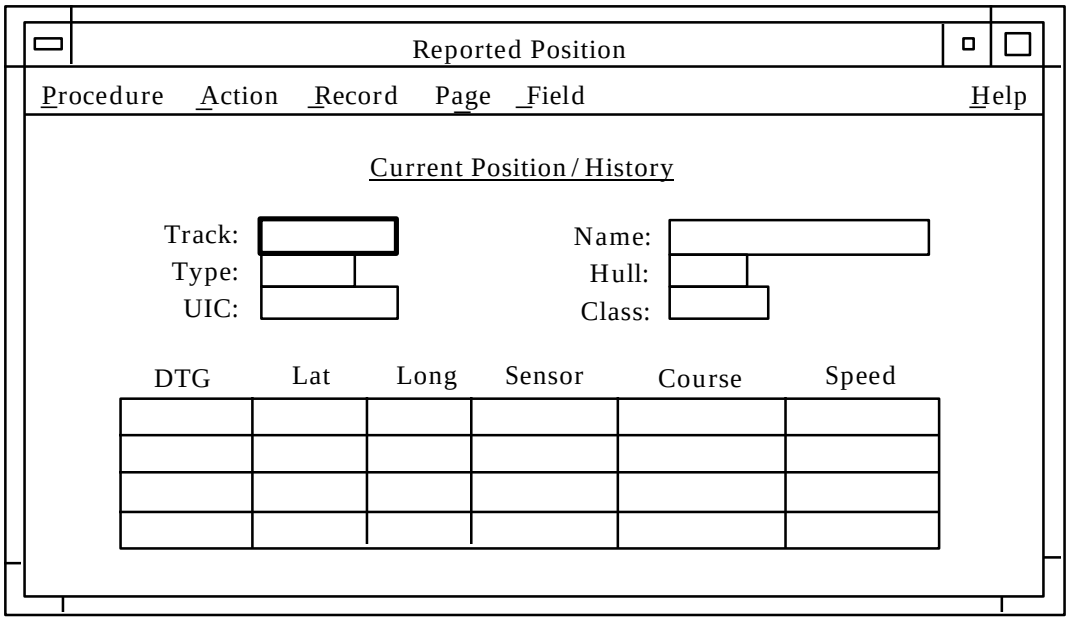

Figure 10-1. Example data entry window in Motif.

If the data being entered are tabular, the window arranges the data entry areas in rows and columns, with each one labeled; users are not presented with an empty text window, with no clues as to format, for entering the information. If the data entry area is scrollable, the row and column headings are placed along the edges of the window and remain visible when the window is scrolled. In a group of related data fields, the labels and text fields are both left justified, or the labels are right justified and the text field left justified (as in figure 10-1). A conditional (or dependent) field is placed to the right of or below the field to which it relates. The field can be either unavailable (i.e., grayed out) or not displayed at all until the control to which it relates is selected.

Users can obtain information about a data field and its contents. Options available for providing this information are to automatically display it in the message bar of the window when the field has keyboard focus or to include it in the Help window that accompanies the data entry window.

10.2 TABULAR DATA WINDOWS

A tabular data window, shown in figure 10-2, is used to organize and display alphanumeric information in tabular or columnar form. The window includes vertical and horizontal scroll bars if the information being presented exceeds the space available in the window. If the information can be scrolled horizontally, the column heading scrolls with its associated column. If the information can be

scrolled vertically, the column heading is placed outside the scrollable area and remains visible when the column data are scrolled, and the window includes controls for paging (e.g., Next and Previous push buttons). When users page through the information, the last line on one page is the first line on the next page. Whenever possible, the content of the window is arranged so that it does not extend over more than one page horizontally.

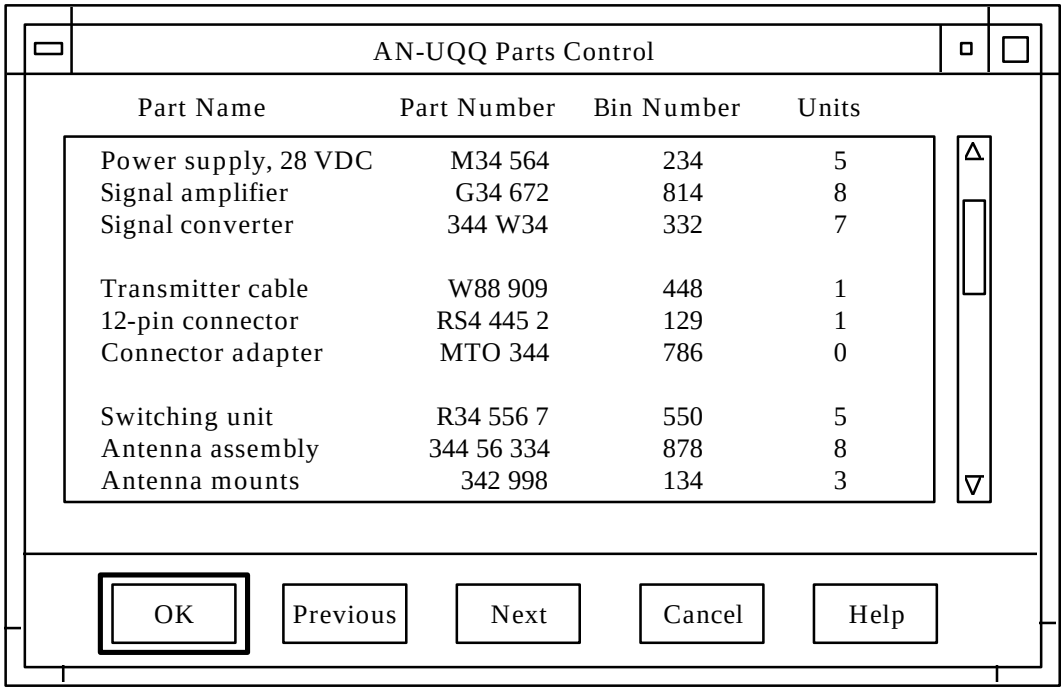

Figure 10-2. Example tabular display window in Motif.

A tabular data window window can be used for display only (as in figure 10-2), or controls can be provided that allow users to manipulate the information. In figure 10-3, the information in the window is presented in a multi-column list, with the items in the list forming the individual records that appear in the rows. Users are able to sort the records that appear in this type of matrix. The headings that can be sorted appear as buttons so that clicking on the heading sorts the records in an order based on the items in that column. The heading remains highlighted after being selected to indicate the column that was sorted. If additional sort variations are needed, they are provided in menus or push buttons in the window. If desired, a speed search capability can also be included in the window so that users can both sort the items in the list and then execute a speed search to scroll to the first instance of an item that begins with a particular letter.

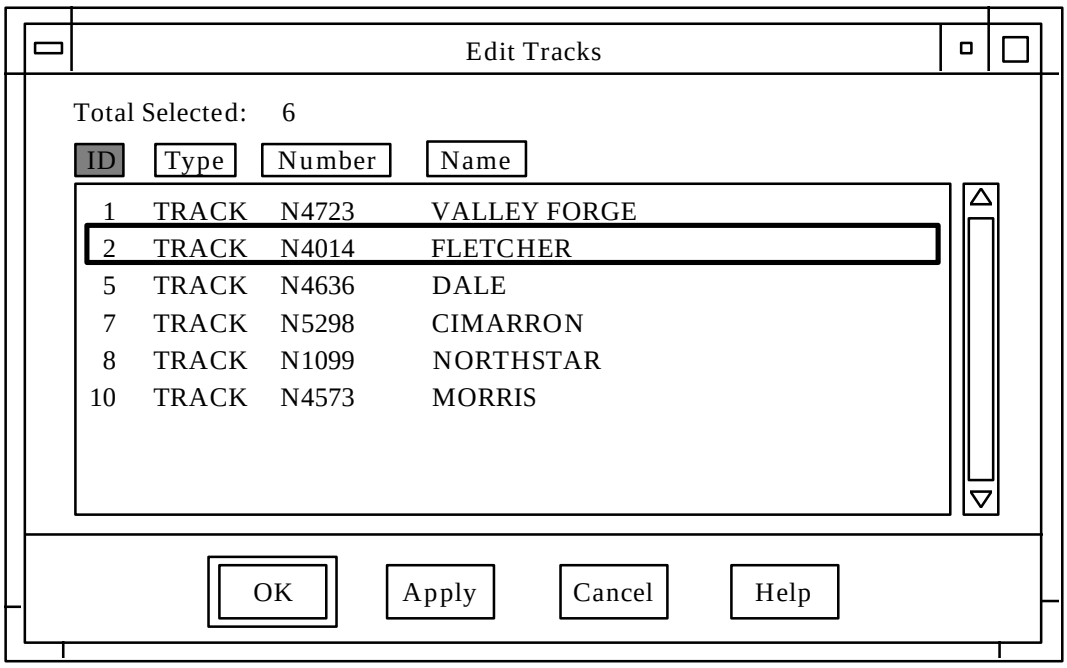

Figure 10-3. Example tabular display window with sort capability in Motif.

10.3 LIST-TO-LIST TRANSFER WINDOWS

A list-to-list transfer window, shown in figure 10-4, is used to move objects from one collection to another. This window contains a source list on the left and a destination list on the right, separated by two push buttons that allow items to be transferred between the two lists. The push buttons can contain text labels (e.g., Add, Remove) or left and right arrows indicating the direction of the transfer. When keyboard focus is on the source list (and one or more of the items is selected), Add is displayed as the default and Remove is disabled. Conversely, when focus is on the destination list, Add is disabled and Remove is shown as the default. The window can include radio and check buttons or option menus that allow users to modify the contents of the source list (e.g., to limit the items in the source list to those with specific features).

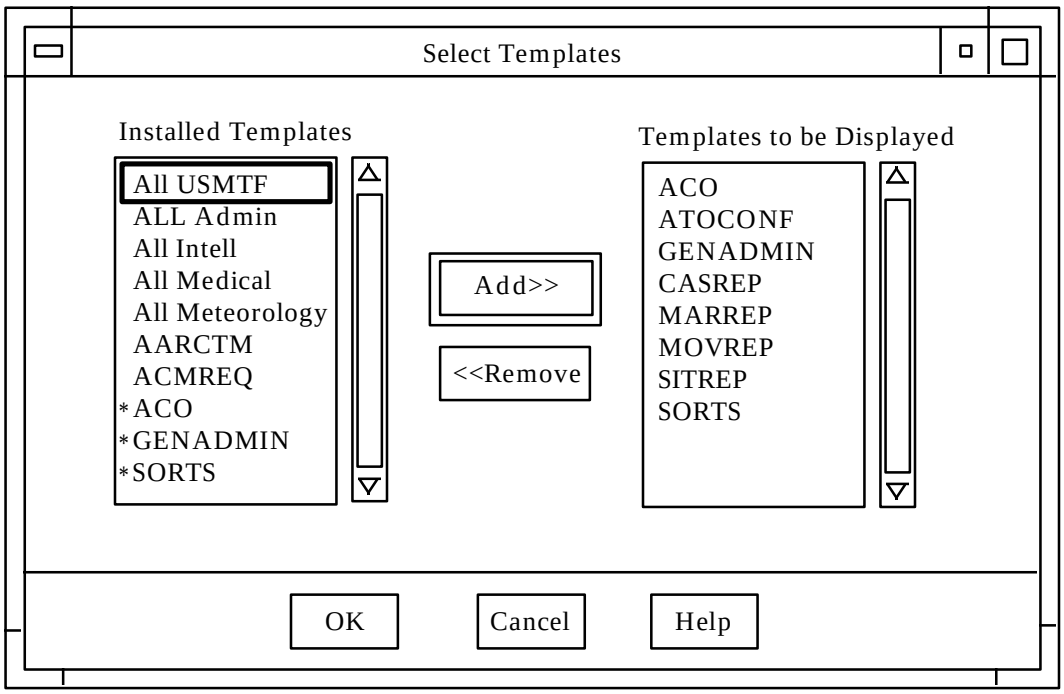

Figure 10-4. Example list-to-list transfer window in Motif.

Users can transfer more than one item at a time between lists but cannot transfer multiple instances of the same item to the destination list. Depending on the nature of the transfer task, an item in the source list can be either copied or moved when users transfer it to the destination list. In the former case, the item is marked (e.g., with an asterisk) to indicate that it has been transferred. The mark is removed when users transfer the item back to the source list.

10.4 MAP WINDOWS

10.4.1 Map Information

A map window, shown in figure 10-5, includes identifying information about the map (e.g., map name, coordinates, area, scale) along with status information (e.g., “drawing map”). This information is presented in the message bar of the window or in a subarea of the window itself. A continuous coordinate indicator giving the pointer location on the map is available in a standard part of the window (e.g., with the identifying information at the bottom of the map).

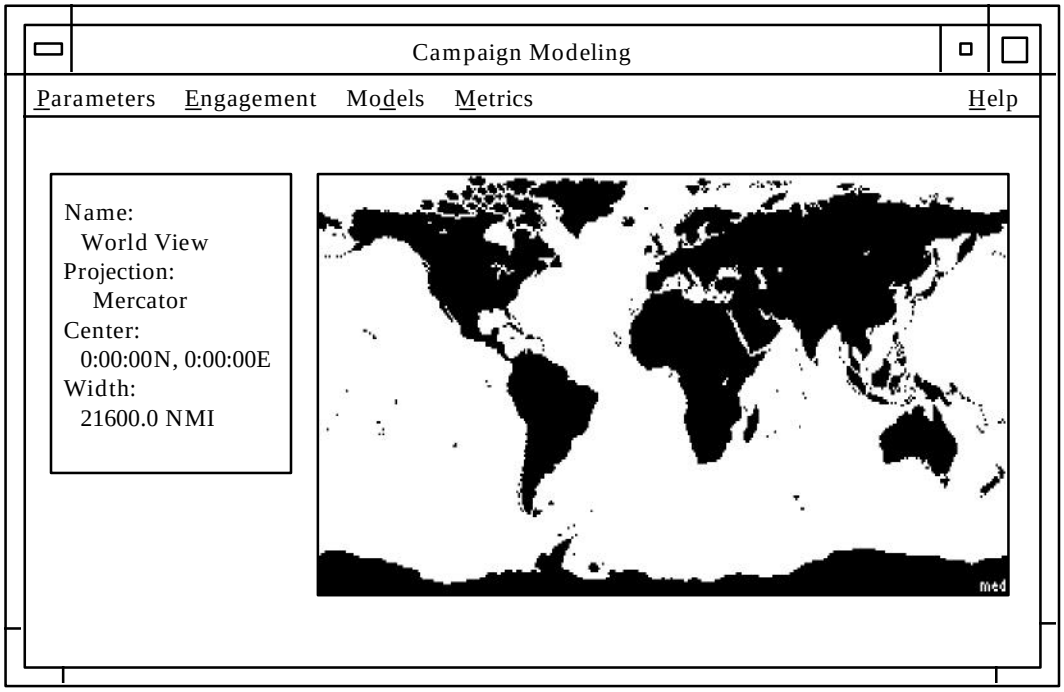

Figure 10-5. Example map window in Motif.

Each map is displayed using the same orientation (i.e., north toward the top of the window), and the important features are labeled. The labels are positioned consistently with respect to the feature they describe (e.g., next to or below the feature), do not obscure important information or clutter the map, and remain legible at all map resolutions. Users can select map features and define their appearance when they are displayed (e.g., select country colors).

Controls for map manipulation are displayed directly in the window or available in individual dialog windows. Users can pan and zoom the map as desired. A position or change indicator is provided as a means for users to return quickly to the normal or starting map. In addition, users can define a baseline (i.e., home) position on a map and return to this position quickly (e.g., by selecting the appropriate menu item).

Users can determine the distance and bearing between any two points on the map. Other functions available to users include areal computation / verification, area of interest selection, and area bounding boxes. Users can enter latitude and longitude to the level of accuracy needed (e.g, degrees, minutes, seconds, tenths or hundredths of seconds); when calculations such as range, bearing, and position are performed, the answer computed reflects the degree of accuracy appropriate to the scale of the map displayed.

10.4.2 Map Objects

Map objects such as symbology are placed on the map accurately or connected to the desired location using arrows, lines, or other graphics. The label for an object appears next to the object and presents essential information (e.g., unit or track identification) about it. The background of the object and label is transparent so as not obscure other information (such as overlays) displayed on the map. The intensity of the map is adjustable so that selected portions of the map can be faded out without losing all map features. If multiple sets of map objects are available, users can select the set desired and switch between sets without losing data.

Users can add, edit, reposition, and delete map objects such as tactical graphics and overlays and change the appearance of information about these objects on the map. When a map is zoomed, the size of these objects (including labels) is adjusted so that users can read them. Objects such as overlays include visual indications (i.e., "handles" displayed on the object) to define the portion of the graphic that is selectable and show where the graphic will be positioned when it is moved to a new location.

The pointing device selection methods listed in table 10-1 are used to select and deselect objects in a map window. If additional selection methods are implemented, they conform to those presented here and in table 3-1; e.g., the pointer indicates the locus where pointing device operations occur. Keyboard methods for selecting map objects conform to methods presented in tables 3-2 or 3-3.

Table 10-1. Pointing device selection methods in a map window.

Single Selection: To select one or more map objects one at a time, position the pointer on an object (i.e., the graphic or its label) and click BSelect. If previously unselected, the object is selected; any objects that were selected remain selected. Add objects to the selection by clicking on other unselected objects.
Range Selection: To perform a range selection, position the pointer near the first object in the range, then press BSelect to set the anchor for the range. Drag the pointer until it is beyond the last object in the range, and release the button to complete the selection. As the pointer is dragged over the objects, a bounding box is displayed outlining the objects being selected. When BSelect is released, the box disappears and the objects that were in the box are selected.
Deselection: To deselect a single object, position the pointer on an object and press <Shift> and click BSelect; the object is deselected and returns to its normal appearance. To deselect all objects, position the pointer on an empty part of the map, and double click BSelect; all previously selected objects are deselected and return to their normal appearance.

Users can view or declutter overlapping map objects and obtain additional information, including exact map coordinates, for selected objects (e.g., by double clicking on the symbol). Users can distinguish among objects that represent coincident points and obtain information that will allow them to resolve ambiguities among the objects. Users can make selections quickly and accurately in collections of densely packed or closely overlapping objects (e.g., by selecting from a pop-up menu listing all of the objects).

When users display an object such as a color overlay on a map, a color coding key is also displayed (e.g., in a subarea of the map window or in a separate dialog window) so that users can interpret the information in the overlay. Users can display the coding key as desired without having to redisplay the overlay. If the coding key is presented in a dialog window, the window is the minimum size needed to present the required information and positioned so that it obscures as little of the information on the map as possible. If appropriate, the key functions as a scale so that users can interpret the coding in the overlay easily and accurately.

10.5 GRAPHICAL SCHEDULING WINDOWS

10.5.1 Schedule Design

A graphical scheduling window is used to display timelines or scheduled events. The schedule is displayed with time presented on the horizontal axis and the tasks to be performed arrayed vertically, as shown in figure 10-6.

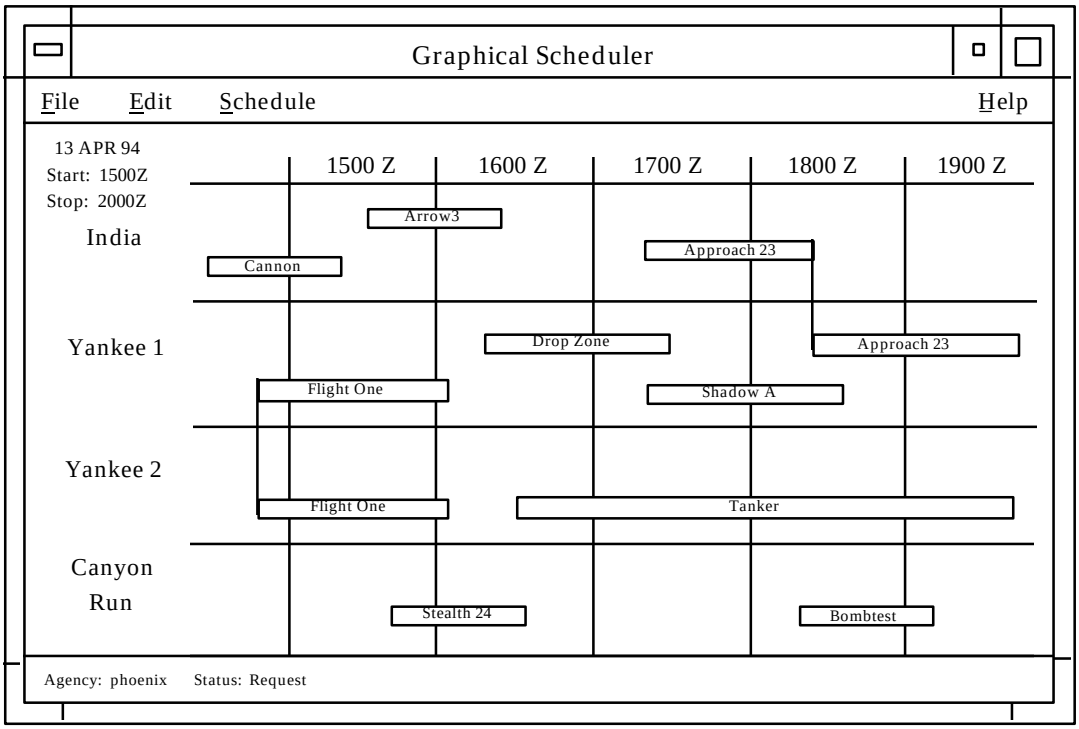

Figure 10-6. Example graphical scheduling window in Motif.

Each event in a schedule is represented by an event icon (in the form of a line or bar) whose length is proportional to the amount of time necessary to complete a task. The icon is displayed to the right of its associated task. Figure 10-7 provides an example of task and event labels and event icons. If different types of events (e.g., ones undertaken at different locations) are presented on a schedule, they are differentiated by color or shading or include an alphanumeric designator displayed on or above the icon for the event. If a coding scheme is applied to the schedule, users can access a legend or key that describes the coding technique used. No more than nine uniquely coded event icons are presented on a schedule at one time.

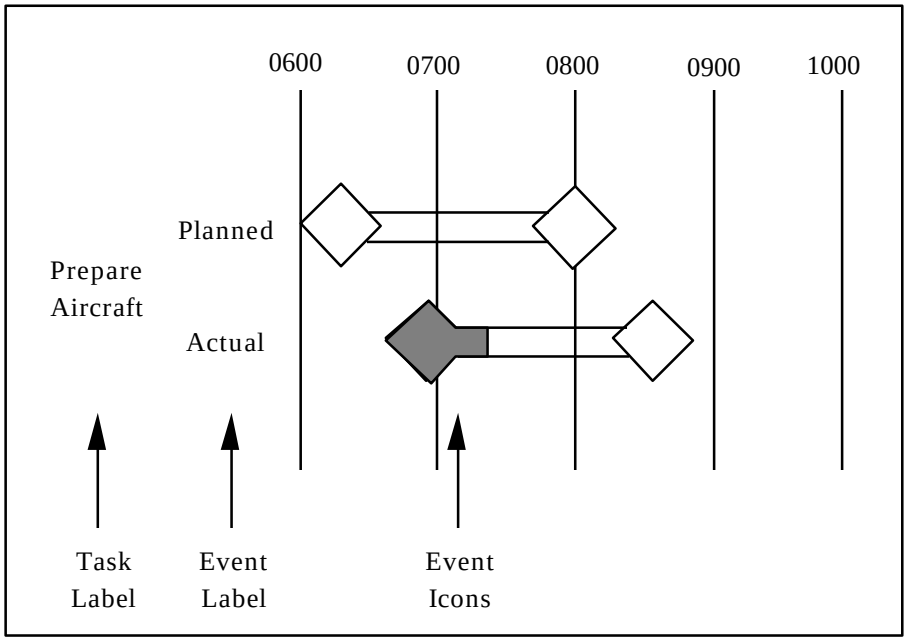

Figure 10-7. Example task and event labels and event icons.

If more than one event icon is used per task, each icon is labeled. For example, a schedule can include event icons representing planned and actual times, or earliest, latest, and actual times. Event icon labels are placed along the vertical axis or on or above the timeline. If appropriate, different scheduling attributes can be represented by displaying symbols with event icons. These symbols can be formed from various geometric shapes (e.g., circles, diamonds, squares), with fill patterns (e.g., filled symbols for events that are underway and hollow symbols for future events) used to indicate various schedule situations.

If the schedule is cluttered or users require a high degree of precision, gridlines can be used to improve the ease and accuracy with which to read information on the schedule. A gridline is displayed to indicate the present date and time; users can display or hide this line as required.

10.5.2 Schedule Manipulation

Users can define the start and stop time of the schedule displayed in the window and can do so to the desired degree of precision (e.g., day, hour). Schedule duration can be a superset of what can be displayed in the window at one time. Users can also display all or a portion of the preselected duration time. For example, users can choose to display only selected days from a schedule with a one-week duration. Users can select an individual event icon and obtain additional information about that event. The pointing device selection methods available to users conform to those listed in table 3-1.

If frequent schedule changes are anticipated, users can reschedule an event icon by directly manipulating the event icon using the object transfer methods described in section 3.5. If exact positioning of an event icon with the pointing device is difficult, the application provides alternative methods for users to locate the icon. For example, the application can allow users to enter the start and stop times for the event using text fields presented in a dialog window or provide a user definable grid that automatically repositions event icons after users place them in a new location.